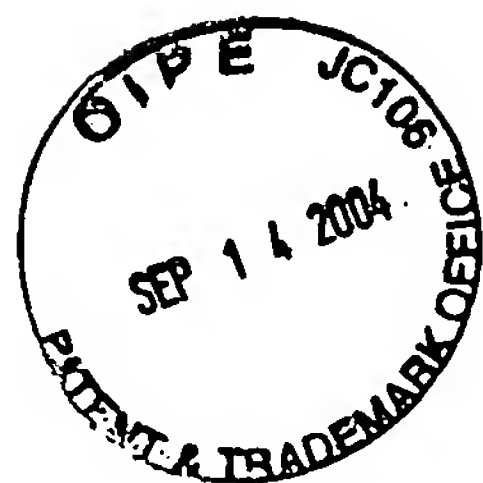


c 65



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September 13, 2004

ATTENTION: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

VIA US POSTAL SERVICE EXPRESS MAIL
EXPRESS MAIL CERTIFICATE NO.: ER 223332770 US

POST ISSUE CORRESPONDENCE

In RE:

Inventor: Stephen Weinreich
US Patent No.: 6,786,612 B2
Title of Invention: Turning Mirror
Date Issued: September 7, 2004
Application No.: 10/707,436
Date Filed: December 13, 2003
Confirmation No.: 1435
Attorney Docket No.: 51900-SWINV-002
Examiner Name: Mohammad Yunus Sikder
Group Art Unit: 2872

*Certificate
SEP 20 2004
of Correction*

REQUEST FOR CERTIFICATE OF CORRECTION UNDER 37 CFR § 1.322

Dear Sir:

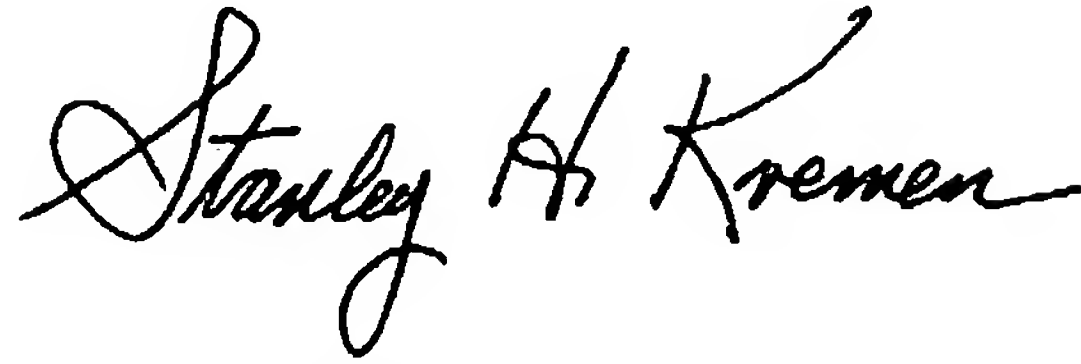
The purpose of this letter is to request correction of an already issued patent arising from an Office mistake. A notice of allowance for this application was mailed by the Office on May 15, 2004. The Applicant/Inventor paid the issue fee on July 27, 2004. The original drawings submitted with the application on December 13, 2003 were informal. On July 19, 2004, prior to payment of the issue fee, the Applicant submitted formal drawings that were to serve as replacement drawings to the original informal drawings. The Applicant asserts that the formal replacement drawings represent a better description of what he considers to be his invention. The Examiner approved the formal drawings for inclusion in the US Patent document on August 10, 2004. Copies of the various communications and the patent is provided as an attached exhibit to this letter.

The Inventor hereby requests that the formal drawings submitted on July 19, 2004 be substituted for the original informal drawings in the US Patent Document and that a Certificate of Correction be issued. Since failure to include the formal drawings was an Office mistake, 35 U.S.C. § 254, 37 CFR § 1.322, and MPEP § 1480 provide for the Certificate of Correction to be issued without charge to the Inventor.

SEP 21 2004

Thank you for your kind and prompt attention to this matter.

Respectfully submitted,

A handwritten signature in black ink, reading "Stanley H. Kremen". The signature is written in a cursive style with a large, stylized "S" and "K".

Registered Patent Agent,
Registration No. 51900
Customer No. 34325

07-20-04

IFW



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July 19, 2004

Mail Stop Amendment
Commissioner for Patents
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VIA US POSTAL SERVICE EXPRESS MAIL
EXPRESS MAIL CERTIFICATE NO.: ER 223332488 US

In RE:

Application No.: 10/707,436
Date Filed: December 13, 2003
Confirmation No.: 1435
Applicant: Stephen Weinreich
Title of Invention: Turning Mirror
Examiner: Mohammad Yunus Sikder
Group Art Unit: 2872

COMMUNICATION FOLLOWING ALLOWANCE

SUBMISSION OF REPLACEMENT DRAWINGS

Dear Sir:

A notice of allowance for the above referenced application was mailed by your Office on May 12, 2004. The drawings submitted with the initial filing were informal. Although the Examiner found the informal drawings acceptable for patent publication, the Applicant wishes to submit formal amended replacement drawings at this time. The new drawings consist of the following changes:

- Figure 1 is hatched.
- A separate reference number 420 is provided for each Figure 3 and Figure 3A.
- Connecting lines do not touch numbers.
- Connecting lines do not touch elements.
- Extraneous construction lines are deleted from Figure 5.
- Arrowheads are added to connecting lines, where needed for clarity.
- An eye is reintroduced to viewer 500.
- The replacement drawings correctly position viewer 500, particularly the eye.

SEP 21 2004

- The replacement drawings represent viewers 500 and 500' in a manner consistent with each other and with the balance of the drawings.
- The replacement drawings represent viewer 500 in a recognizable manner.
- Line weights are correctly expressed and some line weights are adjusted for consistency.
- The square root symbol in Figure 4B is completed.
- Many reference numbers and letters are repositioned for readability.
- In Figure 2, reference numbers 210 and 212 are correctly assigned.
- Mirror thickness is indicated in Figure 4A.
- Hidden lines are dashed.
- Edge of mirror circle and inside of housing are shown in Figure 2 for consistency.
- The sheet format is corrected, and the sheets are properly labeled.

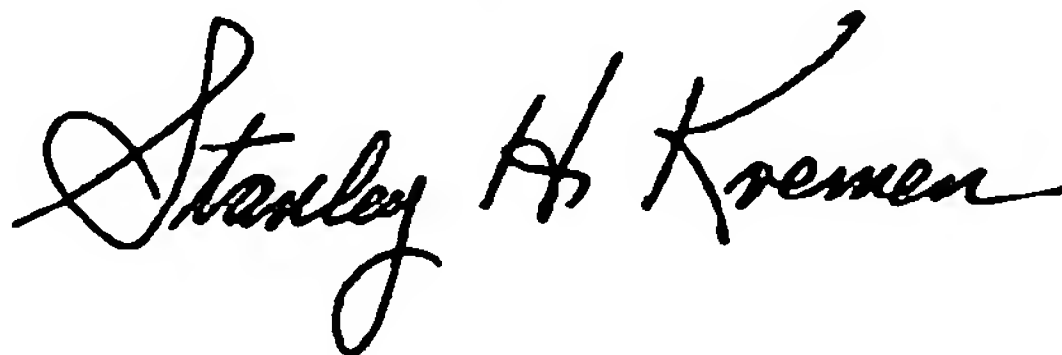
No new matter has been introduced in the replacement drawings. The Applicant believes that amendments to the drawings are necessary for clarity of the written description requirement of 35 U.S.C. § 112 ¶ 1.

Please accept the replacement drawings as formal drawings for inclusion in the published patent.

A return receipt post card has been attached to this communication. Please date stamp the post card and return it to me to indicate receipt of this communication.

Thank you for your kind and prompt attention to this matter.

Respectfully submitted,

A handwritten signature in black ink, reading "Stanley H. Kremen". The signature is fluid and cursive, with the first name "Stanley" being the most prominent part.

Stanley H. Kremen,
Registered Patent Agent
Registration No. 51900
Customer No. 34325



TURNING MIRROR

STEVE WEINREICH
REPLACEMENT SHEET

10/707,436

1/5

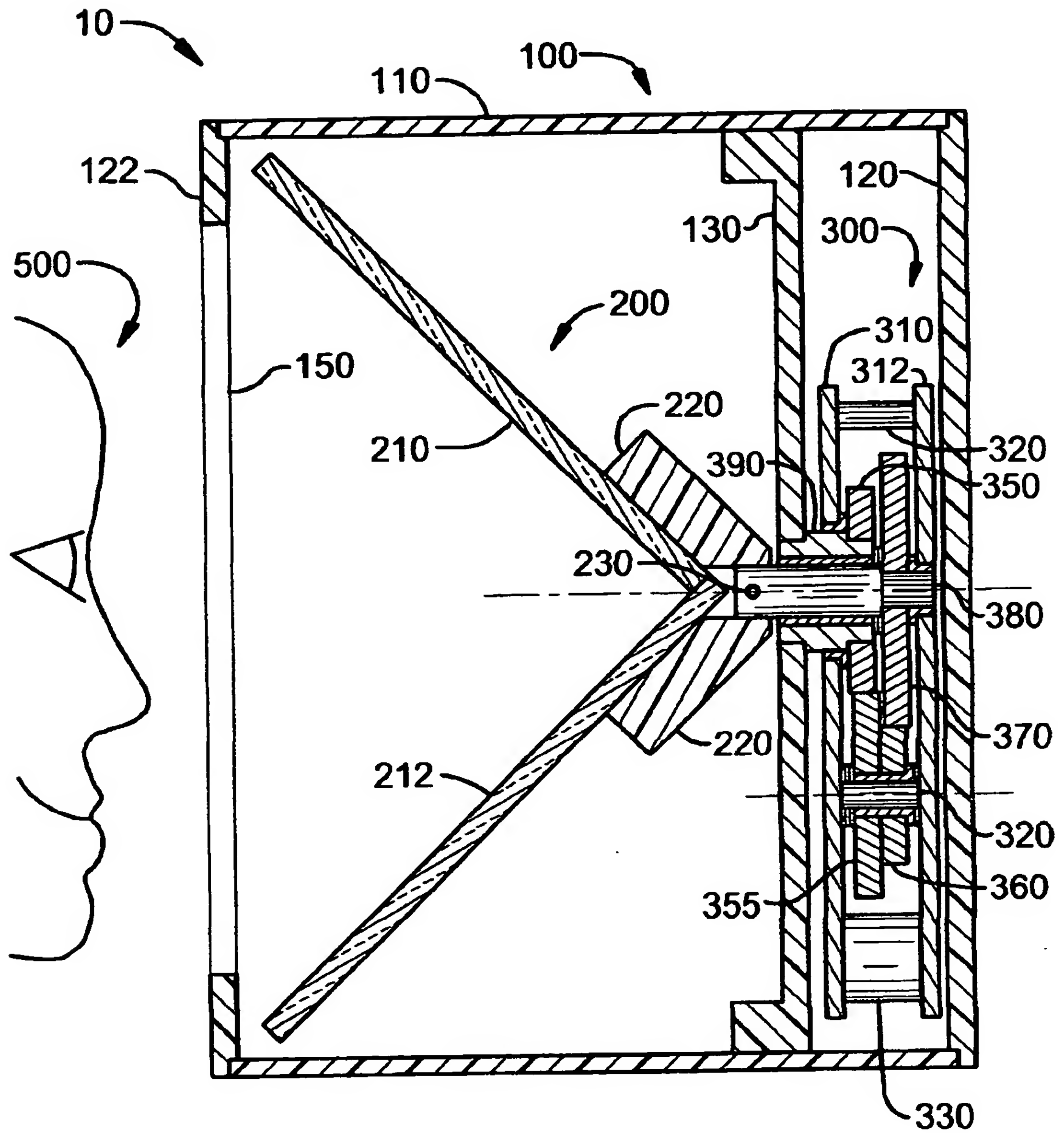


FIG. 1

2/5

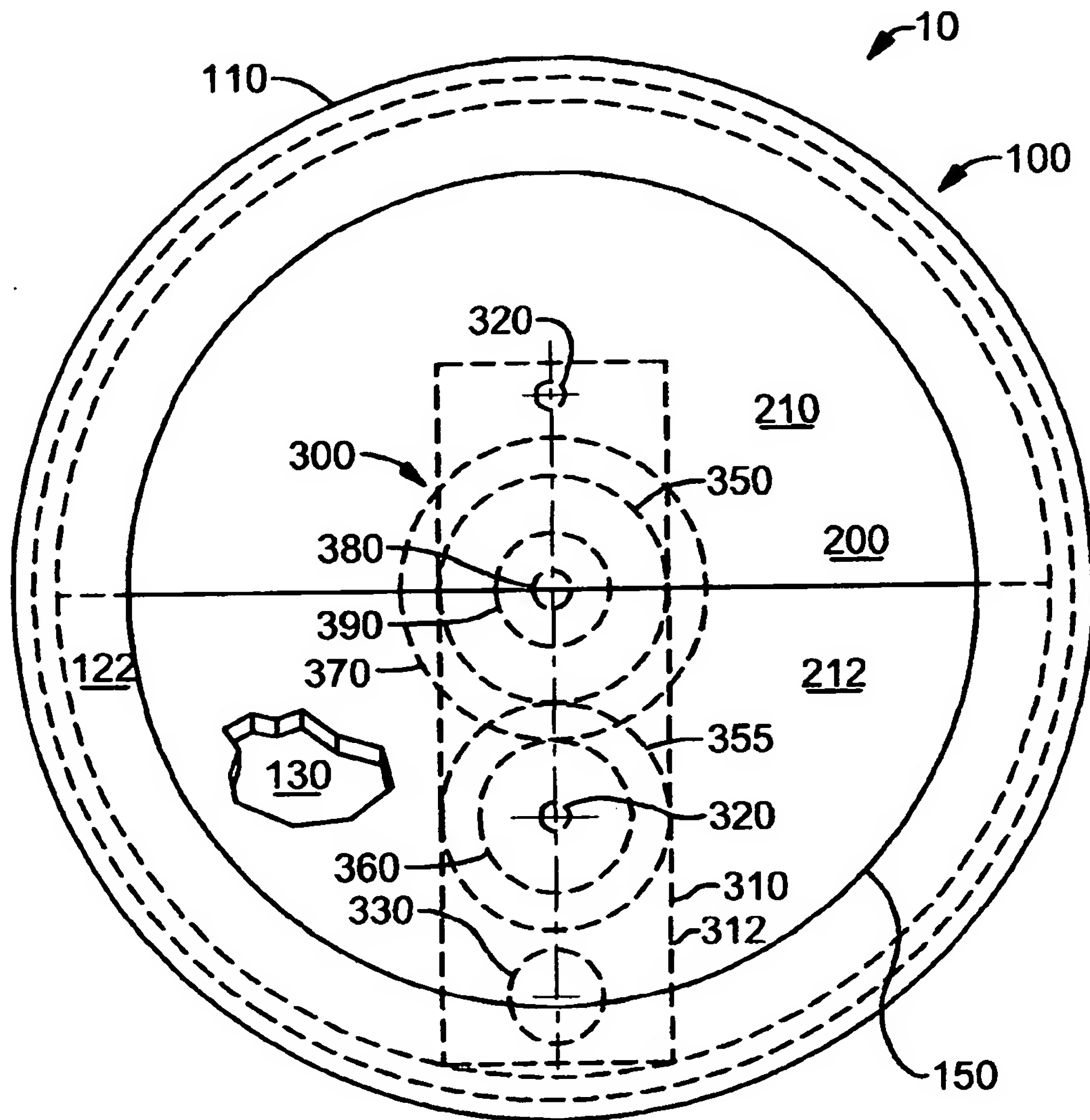


FIG. 2

3/5

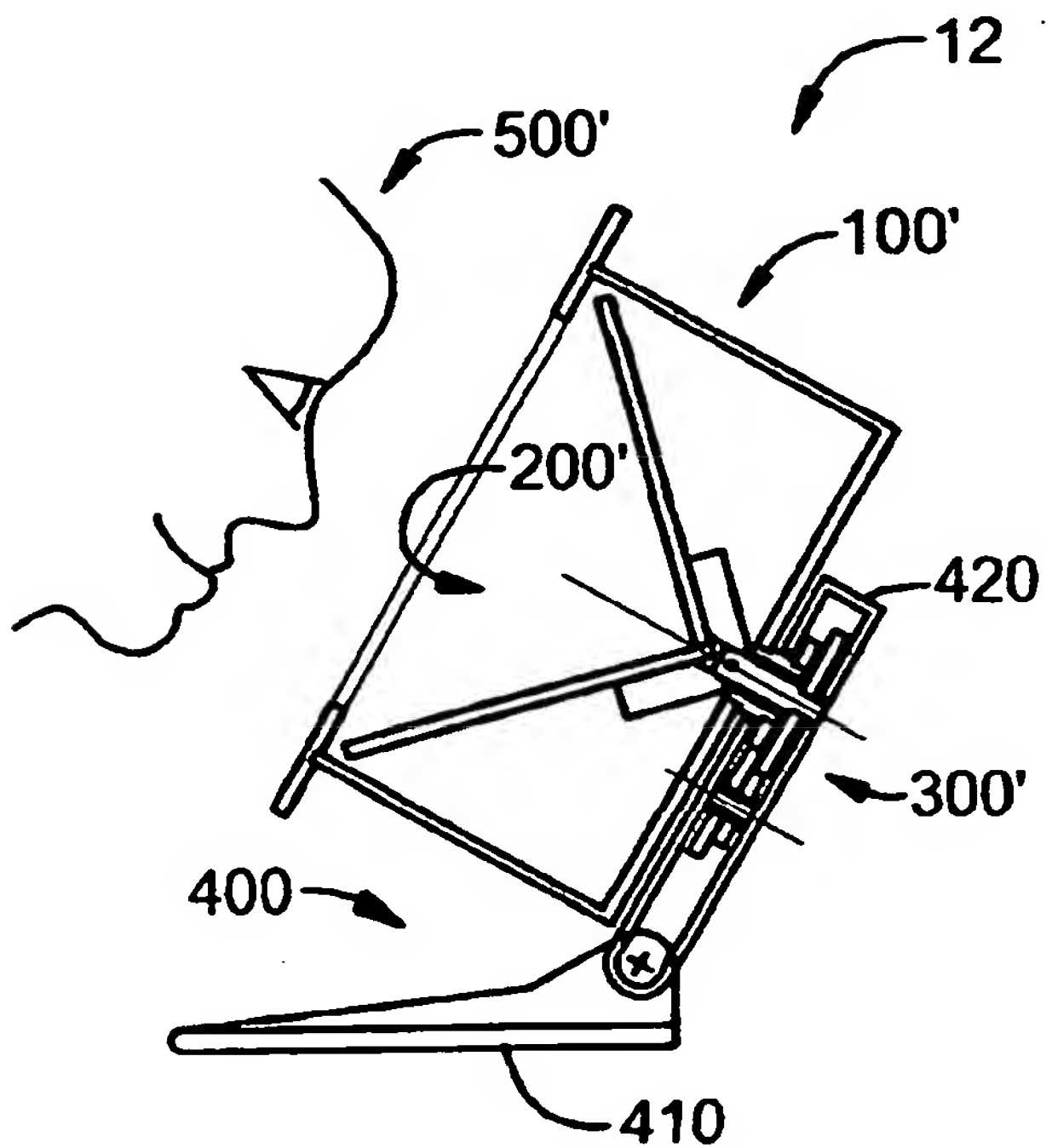


FIG. 3

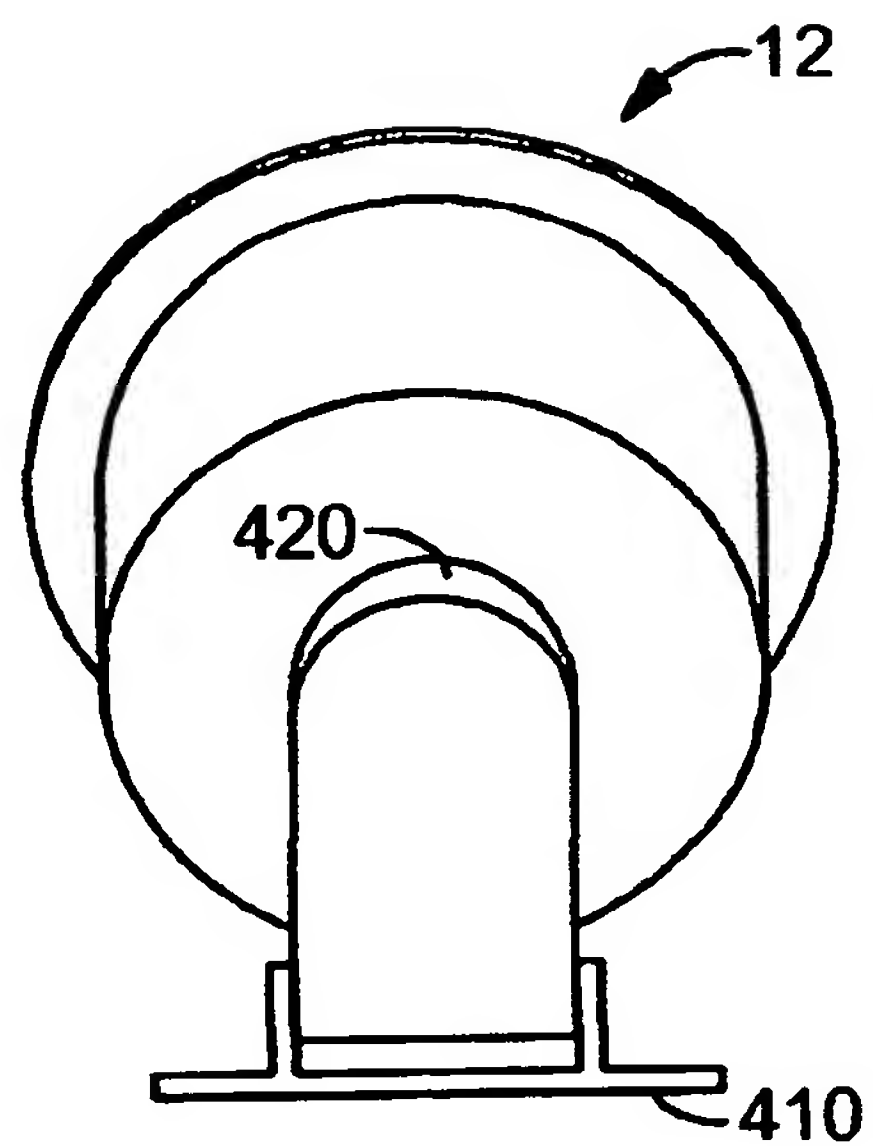


FIG. 3A

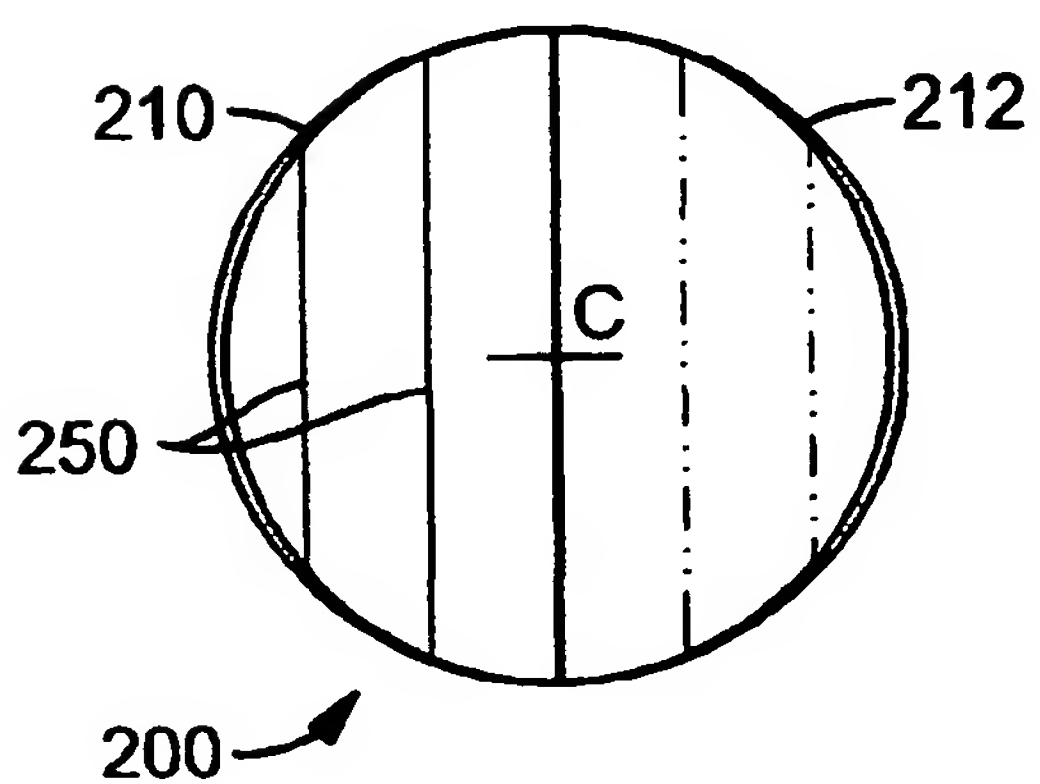


FIG. 4A

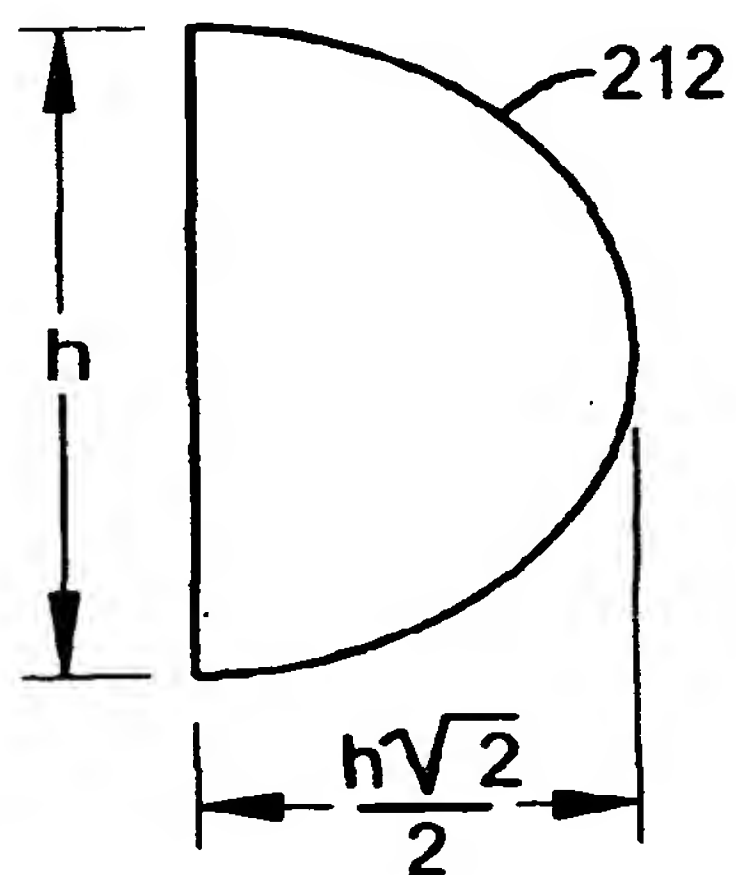


FIG. 4B

4/5

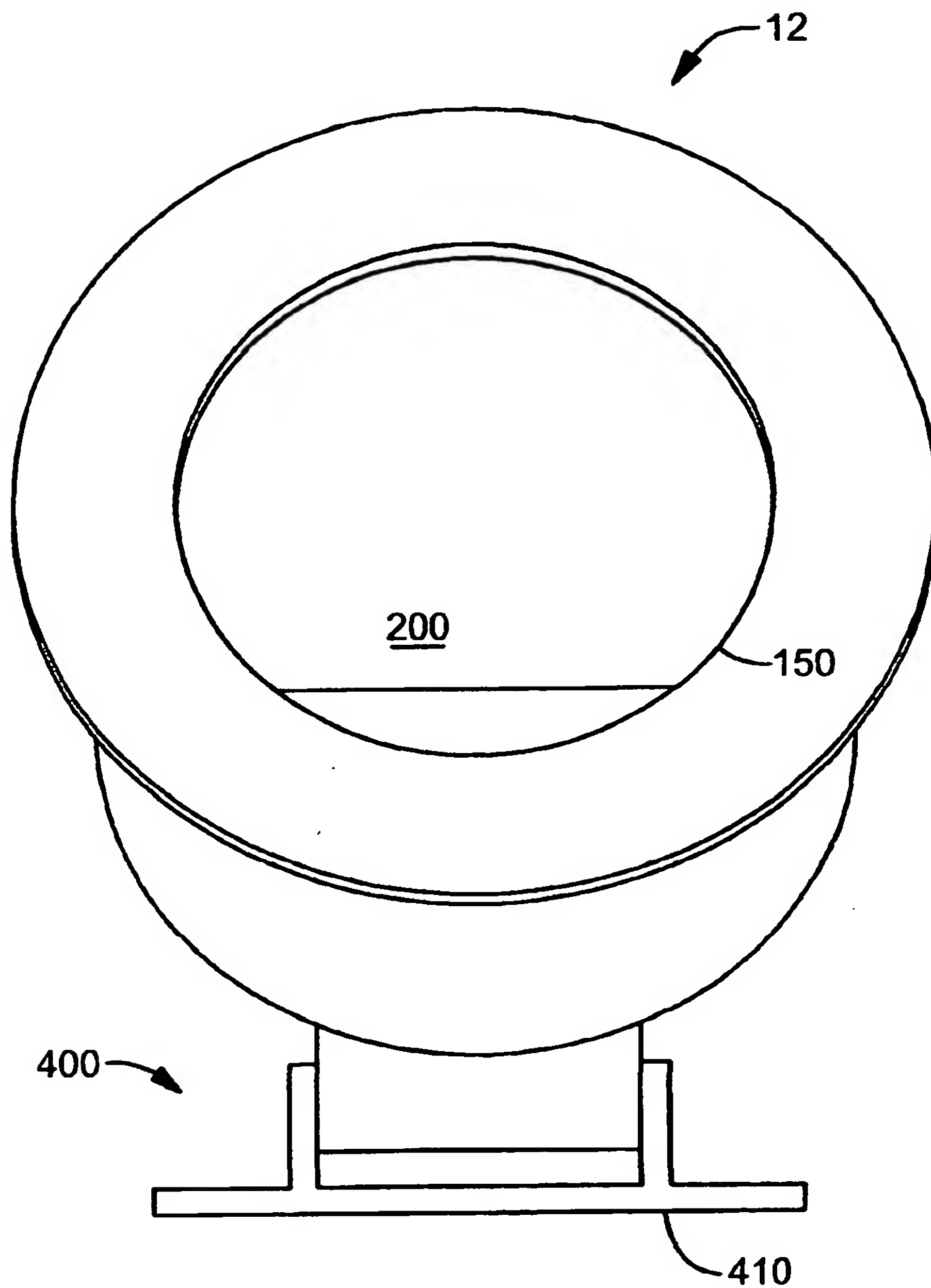


FIG. 3B

5/5

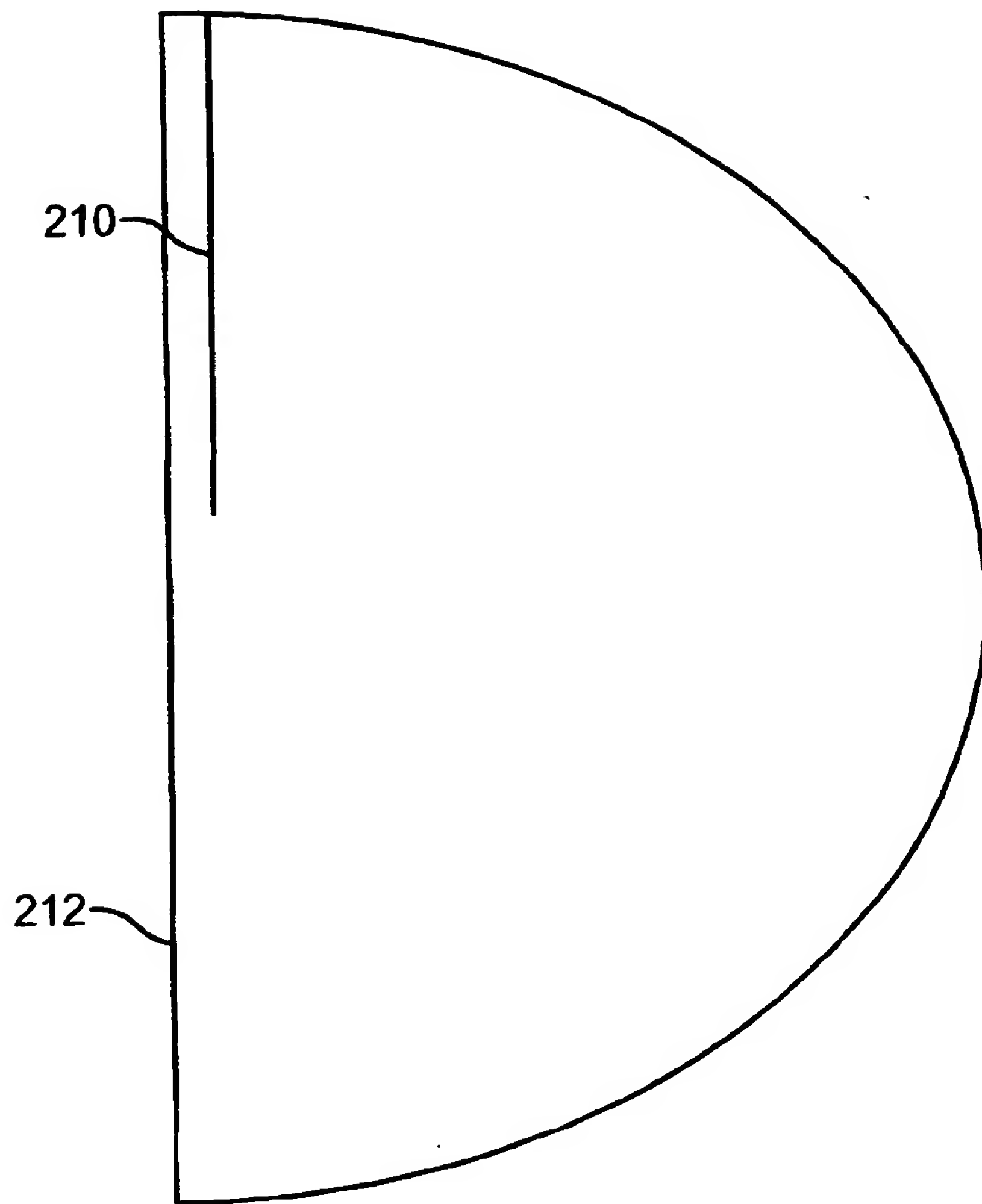


FIG. 5



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,436	12/13/2003	Stephen Weinreich	51900-SWINV-002	1435
34325	7590	08/10/2004	EXAMINER	
STANLEY H. KREMEN 4 LENAPE LANE EAST BRUNSWICK, NJ 08816			SIKDER, MOHAMMAD YUNUS	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.



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APPLICATION NO/ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
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10/ 707, 436

EXAMINER

ART UNIT	PAPER
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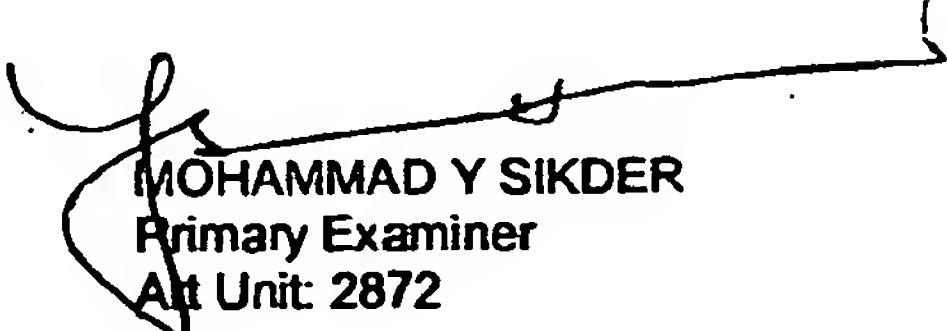
20040801

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

Replacement drawings received on 7/19/04 are accepted by the examiner.


MOHAMMAD Y SIKDER
Primary Examiner
Art Unit: 2872



US006786612B2

(12) **United States Patent**
Weinreich

(10) Patent No.: **US 6,786,612 B2**
(45) Date of Patent: **Sep. 7, 2004**

(54) **TURNING MIRROR**

(76) Inventor: **Stephen Weinreich**, 14 Norton Rd.,
Monmouth Junction, NJ (US) 08852

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/707,436**

(22) Filed: **Dec. 13, 2003**

(65) **Prior Publication Data**

US 2004/0109246 A1 Jun. 10, 2004

Related U.S. Application Data

(62) Division of application No. 09/360,267, filed on Jul. 26,
1999, now abandoned.

(60) Provisional application No. 60/100,717, filed on Sep. 17,
1998.

(51) Int. Cl.⁷ **G02B 7/182**

(52) U.S. Cl. **359/871; 359/872; 359/879**

(58) Field of Search **359/871-872,**
359/879, 855-856, 220; 248/309.1; 358/248

(56) **References Cited**

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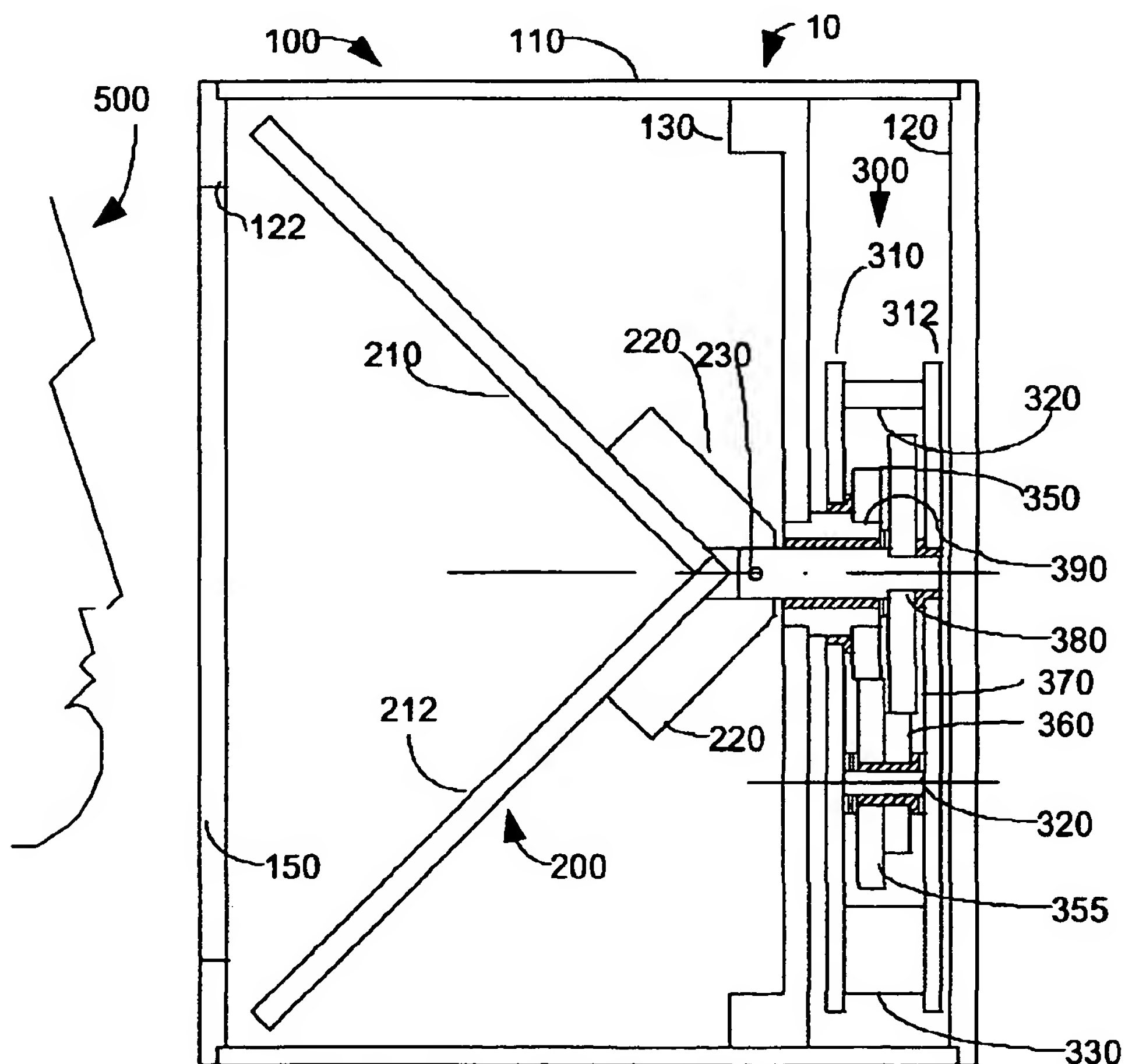
Primary Examiner—**Mohammad Sikder**

(74) *Attorney, Agent, or Firm*—**Stanley H. Kremen**

(57) **ABSTRACT**

A mirror which the viewer's reflection rotates clockwise or
counterclockwise along with the rotation of the mirror.

15 Claims, 5 Drawing Sheets



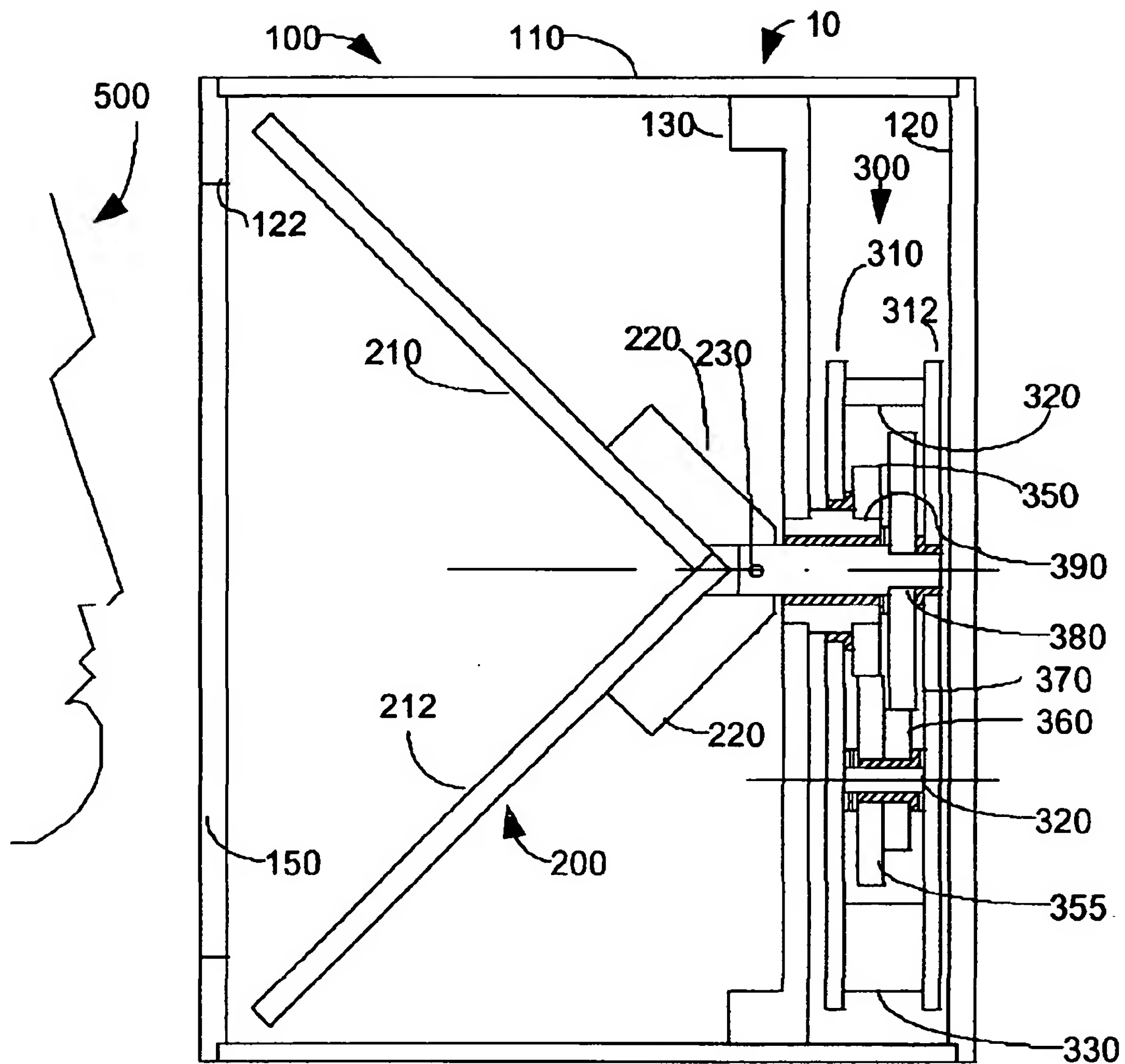


FIG. 1

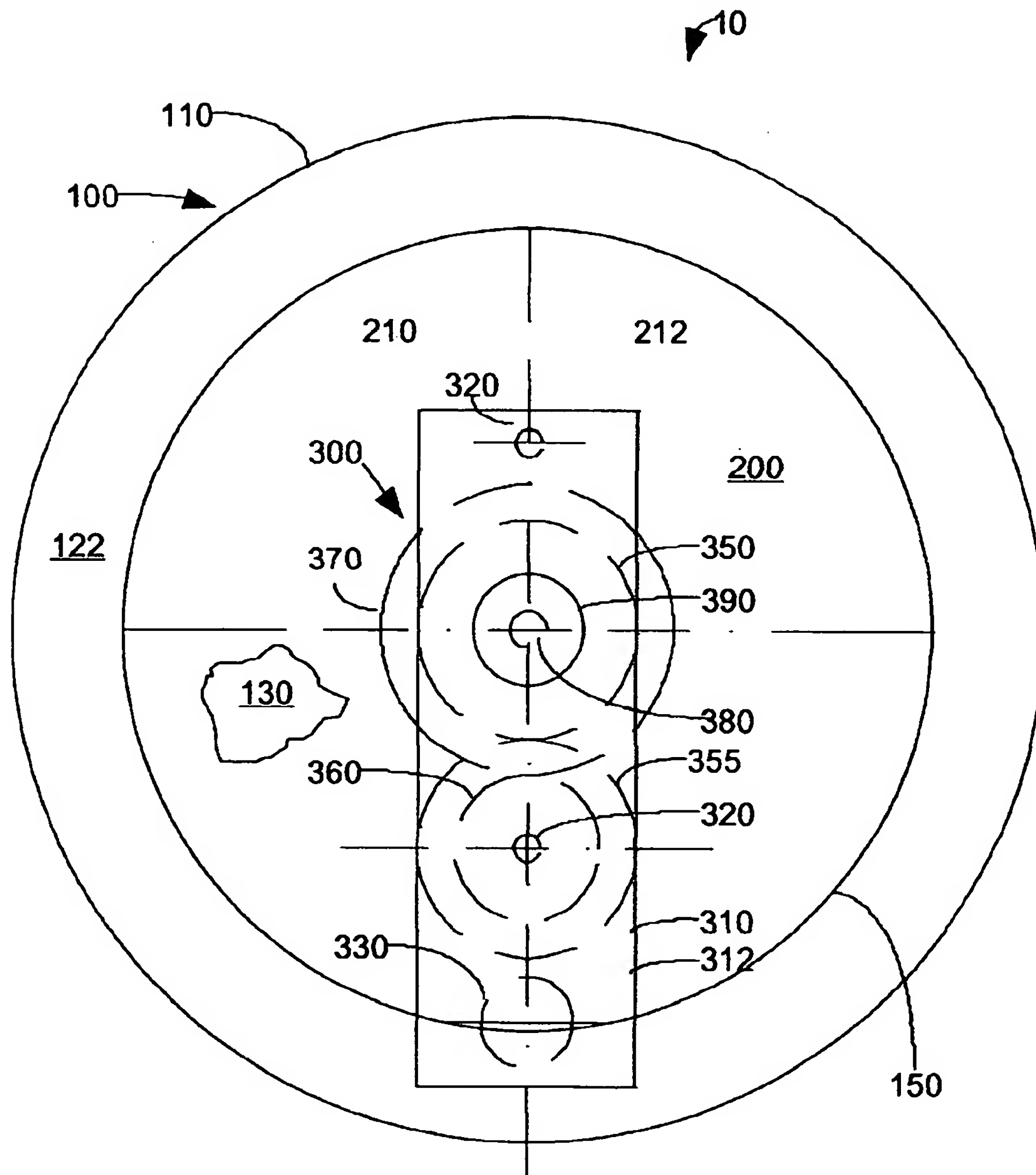


FIG. 2

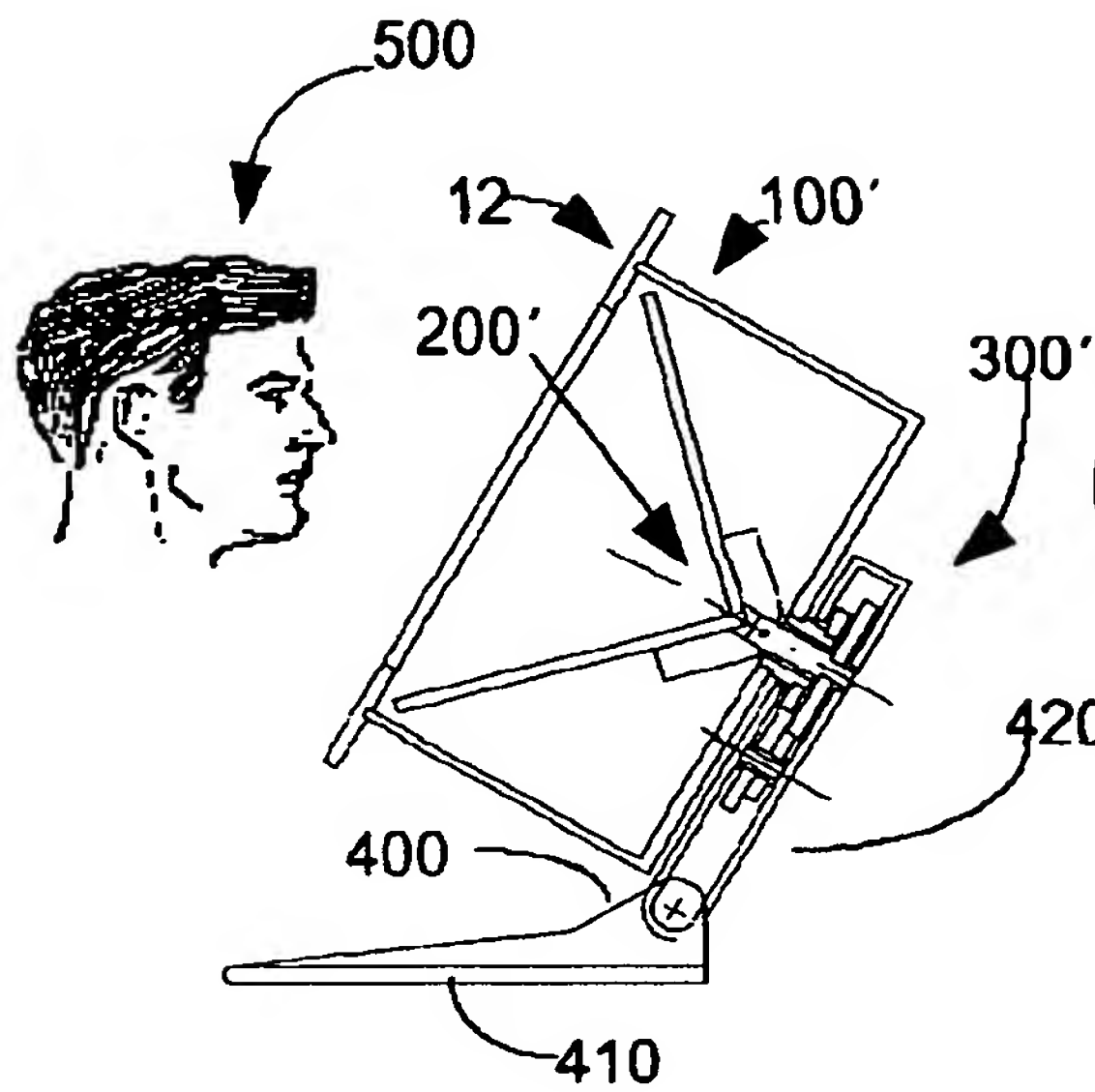


FIG. 3

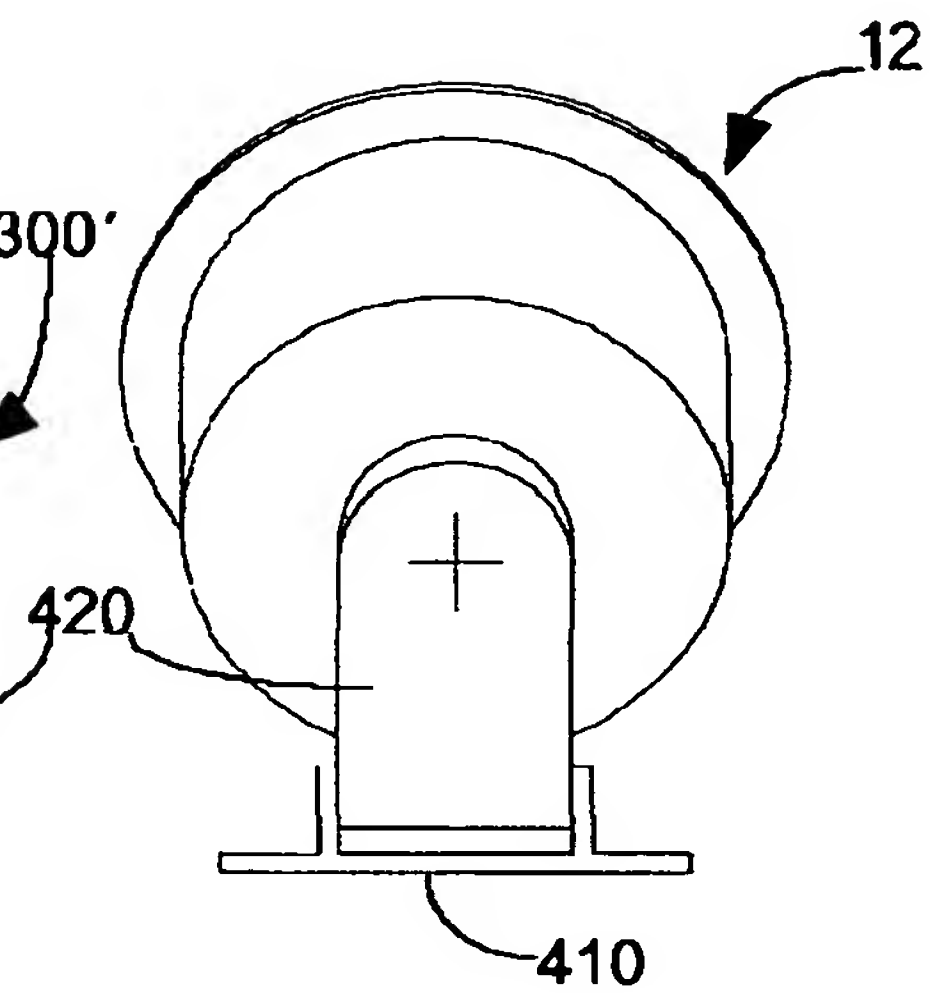


FIG. 3A

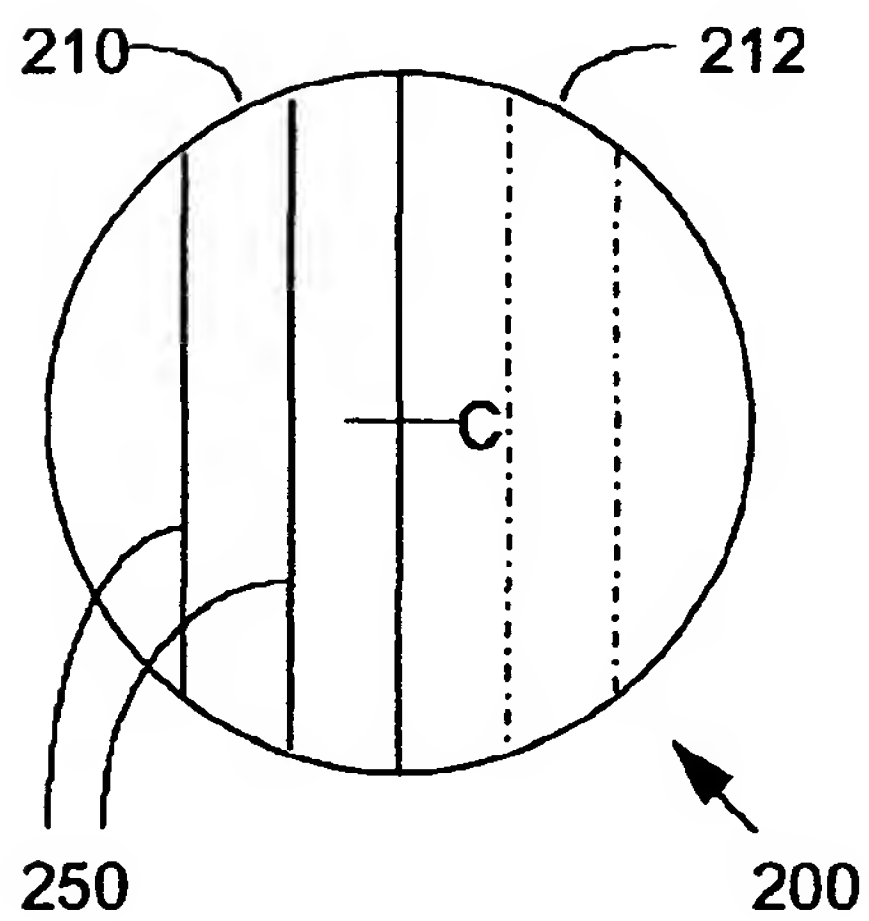


FIG. 4A

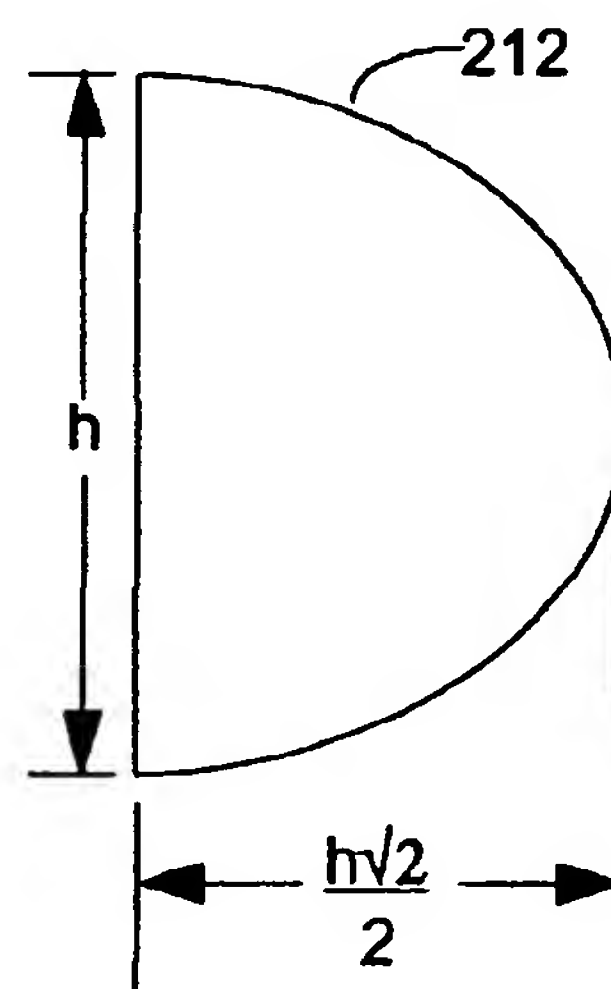


FIG. 4B

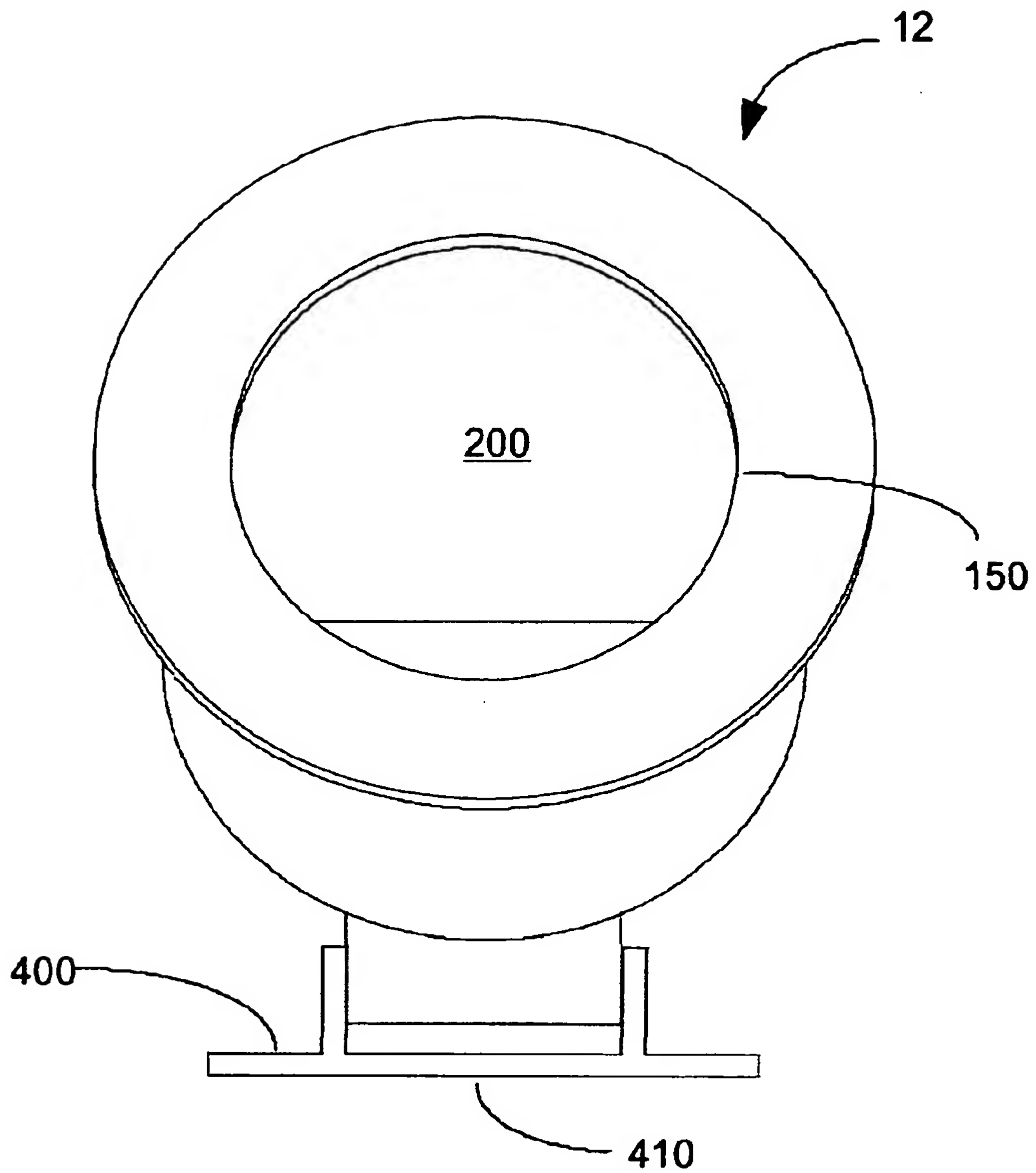


FIG. 3B

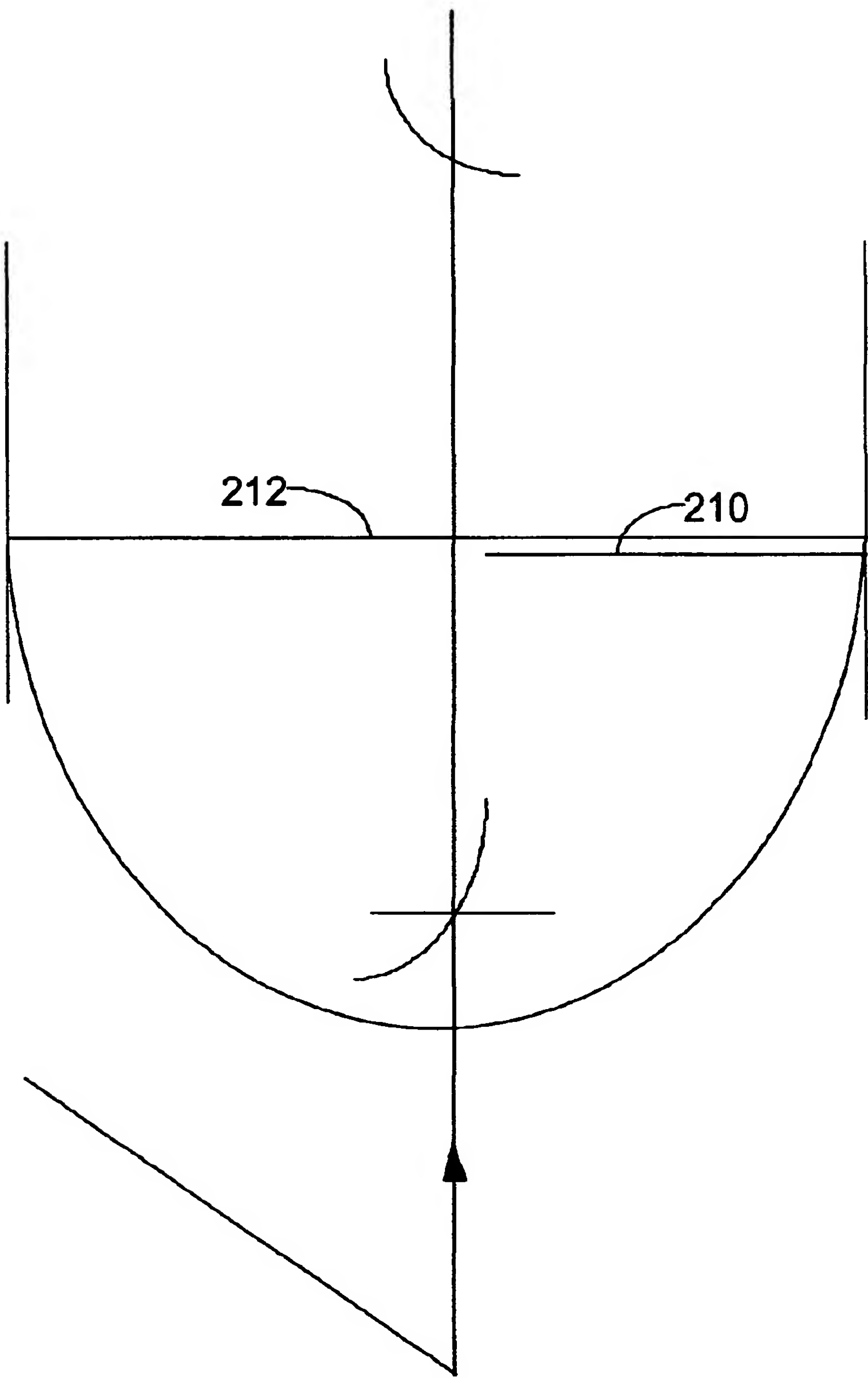


FIG. 5

1

TURNING MIRROR

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a division of and claims domestic priority to my U.S. Non-Provisional patent application Ser. No. 09/360,267 filed on Jul. 26, 1999, entitled TURNING MIRROR, now abandoned and incorporated herein by reference; and further claims domestic priority to my Provisional Patent Application No. 60/100,717 filed Sep. 17, 1998, also entitled TURNING MIRROR, also incorporated herein by reference. No new matter has been introduced into the present application.

SUMMARY OF INVENTION

The TURNING MIRROR is a mirror in which the reflection rotates with the mirror's frame. The Turning Mirror can be used as a toy and in displays and for other purposes.

As is well known in the art, two planar mirrors arranged in plan to form a right angle (i.e., joined at 90-degrees about a vertical axis) will produce a non-reversed (i.e., not "mirror image") mirror image. In such a mirror arrangement, one's left eye, e.g., will appear as the left eye of one's reflection. The mirrors are preferably first-surface to minimize the mirrors' junction and, therefore, to minimize any discontinuity at the centerline of the reflected image.

To further disguise any apparent centerline, the mirrors may be scored at regular (or irregular) intervals, parallel to the centerline.

If, however, such a mirror arrangement is rotated (such that the joint is no longer vertical), the reflected image will also be rotated. If, e.g., one looks at one's reflection in such a mirror arrangement and rotates the arrangement so that the joint becomes horizontal, one's reflection will be inverted.

For some uses it may be sufficient (and particularly economical) to simply join mirrors at 90-degrees along a horizontal line. The mirrors will invert the reflections of passersby.

For most uses it is preferred to rotatably mount the mirror assembly. The axis of rotation preferably passes perpendicularly through the center of the mirror joint, at 45-degrees from each mirror. Rotation is preferably manual, but may be motorized by ordinary means. A housing for the mirror assembly is preferred in order to disguise the special structure of the mirror and to protect it.

As was discussed above, as the mirror joint is rotated to horizontal, the reflection becomes inverted. It is therefore apparent that the reflection rotates twice as fast as the mirror assembly (or mirror assembly in housing) itself.

It is, however, preferred that the reflection appear to rotate along with the mirror assembly. The reflection thus seems to be "stuck" to the assembly. Without modifying the optical structure, this illusion can be created by rotatably mounting the mirror assembly within a preferred housing. The mirror assembly and housing are coupled so that the housing rotates twice as fast as the mirrors. The most visible elements, the reflection and housing, therefore rotate at the same rate, resulting in a compelling illusion.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a side section through the center of a preferred embodiment of the invention.

FIG. 2 is a front elevation of the preferred embodiment of FIG. 1.

2

FIG. 3 is a side section through the center of an alternate embodiment of the invention.

FIG. 3A is a rear elevation of the alternate embodiment.

FIG. 3B is a front elevation of the alternate embodiment.

FIG. 4A is a front elevation of a preferred embodiment of the two mirrors of the invention.

FIG. 4B shows the shape of one of these mirrors.

FIG. 5 is a more accurate delineation of the shape indicated in FIG. 4B, for the preferred embodiment of FIGS. 1 and 2.

DETAILED DESCRIPTION

Referring particularly to FIG. 1, with same numbers indicating same parts:

The preferred Turning Mirror apparatus 10 is comprised of a housing 100, a mirror assembly 200, and a gearbox 300.

Housing 100 is primarily a tube 110 which may be of any convenient material, preferably lightweight, economical, and durable, such as cardboard or suitable plastic. Back cover 120, also of any convenient material, such as wood or cardboard, is fitted to close one end of tube 110 and may be fastened in place. Front cover 122 is similar to back cover 120, but contains a window 150 through which mirror assembly 200 can be seen. The (maybe patterned) window is preferably covered with clear plastic, such as acrylic, to protect mirror assembly 200.

Flange 130, which can simply be a wood disc, is mounted to shaft 390 of gearbox 300 (as will be discussed below) and is fitted and connected, as by peripheral screws, to tube 110.

Mirror assembly 200 is comprised of similar first surface mirrors 210 and 212, one of which is slightly smaller, as shown in FIG. 5. As shown in FIG. 4A, optional lines 250 on mirrors 210 and 212 are parallel to the centerline (passing through C), and, therefore, serve to disguise the true nature of the centerline as the apex of the right angle between the mirrors.

Mirrors 210 and 212 are preferably glued to right angle support 220 which may be made as glued up wood blocks. Right angle support 220 is fitted over shaft 380 of gearbox 300 and secured with pin, such as a roll pin, 230.

As shown in FIGS. 4A, 4B, and 5, mirror assembly 200 is fitted to the cylindrical housing 100 by projecting the circular cross section of tube 110 onto mirror assembly 200 to define a half elliptical shape for each mirror 210 or 212. Mirror 210 is slightly smaller than mirror 212 to accommodate the overlap at the 90-degree joint between mirrors.

Shaft 390 of gearbox 300 is tightly fitted to flange 130 and may be further fastened as by staking. In the preferred embodiment, components of gearbox 300 preferably include aluminum support plates, aluminum gears, and shafts of readily machinable steel. Bushings of plastic or oil impregnated bronze support the rotatable components.

Support plates 310 and 312 are spaced from one another by spacers 320 and 330, which are each drilled and tapped at each end, and secured by screws.

Spacer 330 is heavier to cause gearbox 300 to orient itself with spacer 330 at the bottom (as gearbox 300 is essentially free to rotate about shaft 390).

In operation, housing 100 is held so that window 150 is essentially vertical by a user 500 in such a way that the user can see his or her reflection in the mirror. Housing 100 supports gearbox 300 via flange 130 and shaft 390 and mirror assembly 200 via shaft 380. Spacer 330 will hang downward. The beginning orientation of mirror assembly 200 is not significant.

3

The user 500 rotates housing 100 generally about the axis of tube 110. The orientation of gearbox 300 remains essentially constant so the rotation of housing 100 is transferred through flange 130 and shaft 390 to gear 350 which is firmly fastened, as by staking, to shaft 390.

Gear 350 turns same diameter gear 355 and gear 360 which is pinned to and turns with gear 355. Gear 360 in turn drives gear 370 which is twice its diameter. Gear 370 is firmly fastened, as by press fit, to shaft 380 which thereby causes mirror assembly 200 to rotate at half the rate of housing 100. The reflection will rotate at the same rate and in the same direction as housing 100.

In the alternate embodiment 12 of FIG. 3, housing 100' does not enclose gearbox 300' which is instead mounted in upright 420 which is tiltably mounted to foot 410 of base 400. Gearbox 300' obviously does not require a weight to remain vertical.

It will be apparent to one skilled in the art that many of the details described above are not central to the invention. Gears may, for example, be replaced by friction wheels or sprockets with chain or belts. The mirrors need not be elliptical nor so closely fit the housing. Gearing may be deleted for an inferior, but still useful, effect. Size is of little consequence.

In general, while the invention has been described with reference to specific embodiments thereof, it will be appreciated by those of ordinary skill in the art that modifications can be made to the invention without departing from the spirit and scope thereof.

I claim:

1. A method to produce a rotated image of a viewer thereof, said image being observable to the viewer in real-time, comprising the steps of:

- a) arranging two planar mirror surfaces to form an intersection having an interior the planes defined by the surfaces form an intersection having an interior angle of ninety degrees;
- b) positioning a viewer to face the interior angle and about or near an axis that is perpendicular to the intersection and bisects the interior angle; and,
- c) orienting the intersections to be other than perpendicular to a plane that passes through both eyes of the viewer and also is coincident with the line of sight of the viewer.

2. The method of claim 1, wherein the intersection is parallel to the plane that passes through both eyes of the viewer, whereby the image is inverted.

3. The method of claim 1, further comprising the step of: disguising the intersection by forming lines parallel to the intersection at the surface of at least one of the mirrors.

4. A method for rotating a self-image of a viewer, said image being observable to the viewer in real-time, comprising the steps of:

4

arranging two planar mirror surfaces to form a mirror assembly, the planes defined by the surfaces forming an intersection with an interior angle of ninety degrees; positioning a viewer to face the interior angle of the mirror assembly and about or near an axis that is perpendicular to the intersection and bisects the interior angle; and,

rotating the assembly about the axis.

5. The method of claim 4, further comprising the step of: linking, through a linkage, the rotation of the assembly to a rotatable housing, wherein the housing rotates about said axis twice as fast as the assembly.

6. The method of claim 5, further comprising the step of: adding a weight to the linkage sufficient to prevent at least a portion of the linkage from rotating.

7. The method of claim 4, further comprising the step of: disguising the intersection by forming lines parallel to the intersection at the surface of at least one of the mirrors.

8. The method of claim 4, wherein the step of rotating is done manually by the viewer.

9. An apparatus for rotating an image of a viewer thereof, said image being observable to the viewer in real-time, comprising:

two planar mirror surfaces arranged to form a mirror assembly, wherein the planes defined by the surfaces form an intersection with an interior angle of ninety degrees, and wherein the mirror assembly is free to rotate about an axis that is perpendicular to the intersection and bisects the interior angle;

a rotatable housing linked through a linkage to the mirror assembly that enables rotation of the assembly; and, a cover, comprising a window through which a viewer may observe a real-time self-image.

10. The apparatus of claim 9, wherein the cover is free to rotate about said axis at a rate different from that of the mirror assembly.

11. The apparatus of claim 9, wherein the cover comprises a housing generally surrounding the mirror assembly.

12. The apparatus of claim 9, further comprising:

a linkage that causes the assembly to rotate at half the rate of the cover.

13. The apparatus of claim 12, further comprising:

a weight sufficient to prevent at least a portion of the linkage from rotating.

14. The apparatus of claim 9, wherein the perimeters of the mirror are at least partially elliptical.

15. The apparatus of claim 9, wherein the plane of rotation is generally perpendicular to the plane that passes through both eyes of the viewer and is coincident with the line of the viewer.

* * * * *